

What is claimed is:

1. A watercraft having a hull with a roll axis extending along the direction of travel and a pitch axis athwartship and transverse to the roll axis, the watercraft comprising:

*B* first and second elongate, vertically retractable and extensible ~~hydrofoils~~ <sup>skis</sup> mounted to the underside of the hull and having

*B A* long axes parallel to the roll axis and on either side thereof by separate ~~hydrofoil~~ <sup>fore and aft ski</sup> supports;

*A* power means operatively connected to the ~~hydrofoil~~ <sup>ski</sup> supports for selectively ~~extending or retracting each hydrofoil~~ <sup>translationally</sup> ~~hydrofoil~~ <sup>ski support</sup> individually;

roll sensor means mounted in the hull and having a rotational axis parallel to the roll axis for sensing roll angle and generating roll signals therefrom;

a turning mechanism connected to the hull for turning the forward motion of the hull through a turning angle; and

control means interconnecting the power means and the roll

*B* sensor means for altering the relative extension of the two ~~hydrofoils~~ <sup>skis</sup> to reduce the roll tendency of the hull in response to the roll signal.

2. The watercraft according to claim 1 further comprising: turn sensor means operatively connected to the turning mechanism for generating turn signals related to the turning angle; and the control means further interconnected to the turn sensor means for altering the relative extension of the two ~~hydrofoils~~ <sup>skis</sup> to reduce the roll tendency of the hull in response to at least one of the roll signal and the turn signal.

3. The watercraft according to claim 2, further comprising:

pitch sensor means mounted in the hull and having a rotational axis parallel to the pitch axis for sensing pitch angle and generating pitch signals related to the pitch angle;

each hydrofoil being supported by separately extensible and retractable fore and aft supports separately adjustable by

the power means; and  
the control means further interconnected to the pitch sensor  
means for altering the attitude of the hull by selectively  
adjusting the fore and aft supports in response to signals  
from the pitch sensor means.

a 4. The watercraft according to claim 3<sup>314</sup> further  
comprising velocity sensing means connected to the hull for  
generating velocity signals related to the velocity of the hull,  
and the control means further interconnected to the velocity  
sensing means to selectively modify the <sup>ski</sup>hydrofoil elevation and  
retraction in response to the velocity signals.

B 5. The watercraft according to claim 2 further  
comprising velocity sensing means connected to the hull for  
generating velocity signals related to the velocity of the hull,  
and the control means further interconnected to the velocity  
sensing means to selectively modify the <sup>ski</sup>hydrofoil elevation and  
retraction in response to the velocity signals.

B 6. The watercraft according to claim 1 further  
comprising velocity sensing means connected to the hull for  
generating velocity signals related to the velocity of the hull,  
and the control means further interconnected to the velocity  
sensing means to selectively modify the <sup>ski</sup>hydrofoil elevation and  
retraction in response to the velocity signals.

7. The watercraft according to claim 5 further  
comprising fathometer means for sensing water depth connected to  
the hull and providing depth signals for manual control to  
further selectively modify the hydrofoil elevation in response to  
depth signals.

8. The watercraft according to claim 7 further  
comprising a propulsion means attached to each hydrofoil for  
propelling the hull that extends and retracts along with the  
hydrofoil.

B 9. The watercraft according to claim 1 further  
comprising a propulsion means attached to each <sup>ski</sup>hydrofoil for  
propelling the hull that extends and retracts along with the

B <sup>ski</sup>  
~~hydrofoil~~.

10. In a watercraft having a hull with a roll axis extending generally along the direction of travel, a pitch axis athwartship and transverse to the roll axis, a turning mechanism, and a velocity sensing means for providing a velocity signal representing velocity over water, a stabilizing apparatus comprising:

first and second elongate, vertically retractable and extensible <sup>skis</sup> ~~hydrofoils~~ mounted by separate <sup>fore and aft</sup> ~~hydrofoil~~ supports to the hull and having long axes parallel to the roll axis and on either side thereof;

power means operatively connected to the <sup>ski</sup> ~~hydrofoil~~ supports for selectively <sup>translationally</sup> retracting or extending each <sup>ski</sup> ~~hydrofoil~~ <sup>support</sup> individually below the hull;

roll sensor means connected to the hull and having a rotational axis parallel to the roll axis for sensing roll angle and generating a roll signal therefrom;

turn sensor means operatively connected to the turning mechanism and generating a turn angle signal therefrom; and

control means connected for receiving roll signals, turn angle signals, and velocity signals and also connected to the power means for individually altering the extension of the two <sup>skis</sup> ~~hydrofoils~~ to reduce roll tendency in response to at least one of the signals.

11. The apparatus according to claim 10 further comprising:

pitch sensor means connected to the hull and having a rotational axis parallel to the pitch axis for sensing pitch angle and generating a pitch signal therefrom;

each hydrofoil being supported by separately retractable and extensible <sup>fore and aft</sup> supports separately adjustable by the power means; and

the control means being further connected to the pitch sensor means for receiving pitch signals therefrom for altering the attitude of the hull by selective adjustment of the fore and

a aft supports in response to the pitch signals. 159

12. The apparatus according to claim 11 further  
B comprising a propulsion means attached to each <sup>ski</sup>hydrofoil for  
propelling the hull that retracts and extends along with the  
B <sup>ski</sup>hydrofoil.

13. The apparatus according to claim 10 further  
B comprising a propulsion means attached to each <sup>ski</sup>hydrofoil for  
propelling the hull that retracts and extends along with the  
B <sup>ski</sup>hydrofoil.

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